November 1, 2019

To: Regional Assessment of Offshore Exploratory Drilling East of Newfoundland and Labrador
St. Johns, NFLD

From: Keith MacMaster on behalf of Ecology Action Centre
Halifax, NS

**Re: Regional Assessment – Invitation to contribute to literature review**

**Module 7 - Marine Fish and Fish Habitat**

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**Module 8 – Marine Birds**

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**Module 9 – Marine Mammals**

Edwards, Jena, Elizabeth Hiltz, David VanderZwaag, et al., "Advancing Research for the Management of Long-Lived Species: A Case Study on the Greenland Shark." (2019) 6 Frontiers in Marine Science 2

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Jones Jr., Robert C. “Does seismic blasting harm marine life?” Blog, online: https://news.miami.edu/stories/2019/01/does-seismic-blasting-harm-marine-life.html

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*Environmental Assessment of GX Technology Canada Ltd’s GrandSPAN 2D Seismic, Gravity and Magnetic Survey, 2014-2018* (AMEC March 2014);
*Environmental Assessment of MKI Southern Grand Banks Seismic Program, 2014-2018* (LGL March 2014);

*Environmental Assessment of MKI Southern Grand Banks Seismic Program, 2014-2018 Addendum* (LGL 14 July 2014);
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**Conclusions:**

1. Much of the research provided in the presented summaries was older and potentially outdated. I provided newer studies that updates the scientific, legal and regulatory research.
2. More recent studies show that GHG emissions are higher than expected from offshore oil, especially from leakage and flaring. The cited papers have more recent methodologies to calculate the GHG from offshore gas, and should be included in the analysis.
3. There is research on drill oil spills, and this shows it is worse than the summary alludes. Thus, I disagree with this part of analysis. Moreover, there are several lawsuits in Canada and the USA dealing with drill oil spills.

4. Seismic research shows there is a larger impact on marine mammals than previously discussed. More emphasis on the impacts of seismic research is required.
5. There are many more effects on birds than described. For example, oil residue can coat their wings, preventing flying. This does not take an oil spill, but sheens are enough.
6. Oil drilling waste products may be carcinogenic to fish, birds and mammals, especially on eggs and larvae.
7. Oil pollution resulting from "day to day" activities contributes more oil to marine ecosystems than do shipping accidents. These small-scale oil discharges, also known as chronic oil pollution, almost never trigger a formal response in Canada and elsewhere (i.e., in terms of cleanup and other efforts to mitigate potential impacts), primarily because they are small and occur frequently over extensive and remote areas.
8. The cumulative ecological impacts from small-scale discharges may be greater than impacts arising from large-scale catastrophic spills
9. Thus, the term "Unplanned Events" (section 8.4 of Module 8) may be a misnomer. More negative effects on birds and fish occur via the planned events. While we agree that there are no plans to harm the marine environment, harms do occur.
10. Each of these modules should be read in conjunction with each other. Individually an event may be unplanned, but collectively and cumulatively, the impacts will be severe.
11. There is important variability among and within species. Among species, for example, exposure to oil pollution likely varies with foraging behaviour, with species that spend time diving or on the water's surface considered to be at greater risk of exposure than species that forage while flying. Post-breeding moult can result in flightlessness, making individuals more vulnerable to exposure to oil pollution during this period. heavier-bodied, diving species are particularly at risk to oil pollution given the amount of time they spend interacting with the sea-surface–air interface.
12. The Precautionary Approach should be used to deny exploration where data is insufficient or cumulative effects could have negative impacts to the marine ecosystem.